

SUPPLEMENTAL AMENDMENT UNDER 37 C.F.R. § 1.111 Attorney Docket Q66049
U.S. Application No. 09/963,331

AMENDMENTS TO THE CLAIMS

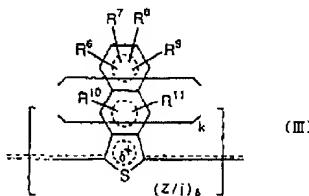
This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-7. (canceled).

Claim 8. (previously presented): A solid electrolytic capacitor comprising a valve acting metal having pores, a dielectric film formed on a surface of the valve acting metal, and a solid electrolyte layer provided on the dielectric film, wherein at least a portion of the solid electrolyte layer is of a lamellar structure,

in which the solid electrolyte layer comprises a composition containing a π -electron conjugate polymer and/or other electrically conducting polymer, in which the electrically conducting polymer is a condensed heteropolycyclic polymer comprising as a repeating unit a structural unit represented by general formula (III) below



wherein the substituents R⁶, R⁷, R⁸, R⁹, R¹⁰ and R¹¹ each independently represents a monovalent group selected from the group consisting of a hydrogen atom, a linear or branched, saturated or unsaturated C1-10 alkyl, alkoxy or alkyl ester group, a halogen atom, a nitro

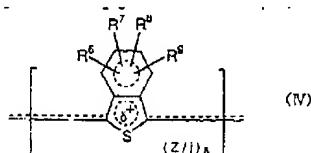
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group, a cyano group, a primary, secondary or tertiary amino group, a trihalomethyl group, a phenyl group and a substituted phenyl group, the alkyl chains of R^6 , R^7 , R^8 , R^9 , R^{10} and R^{11} may combine to each other at any position to form at least one divalent chain for forming at least one 3-, 4-, 5-, 6- or 7-membered saturated or unsaturated hydrocarbon cyclic structure together with the carbon atoms to which the substituents are bonded.

the alkyl group, the alkoxy group or the alkyl ester group of R^6 , R' , R^8 , R^9 , R^{10} or R^{11} or the cyclic hydrocarbon chain formed by the substituents may contain any number of any of carbonyl, ether, ester, amide, sulfide, sulfinyl, sulfonyl and imino bonds.

k represents a number of the condensed ring enclosed by the thiophene ring and the benzene ring having substituents R^6 to R^9 and represents an integer of from 0 to 3 excluding a form in which all of R^6 to R^9 represent a hydrogen atom from among derivatives in which $k=0$, and the condensed ring may optionally contain 1 to 2 nitrogen atoms or N-oxide, δ is *ln* the range of 0 to 1, *Z* represents an anion, *i* is a valency of 2 and is 1 or 2.

Claim 9. (previously presented): The solid electrolytic capacitor as claimed in claim 8, in which the condensed heteropolycyclic polymer represented by general formula (III) is a condensed heteropolycyclic polymer represented by general formula (IV) below where k=0



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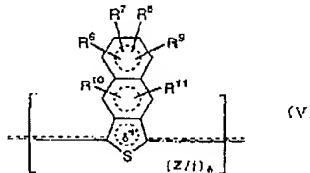
wherein R^6 , R^7 , R^8 , R^9 , δ , Z and j are the same as in formula (III), and the condensed ring may optionally contain 1 to 2 nitrogen atoms or N-oxide.

Claim 10. (previously presented): A solid electrolytic capacitor comprising a valve acting metal having pores, a dielectric film formed on a surface of the valve acting metal, and a solid electrolyte layer provided on the dielectric film, wherein at least a portion of the solid electrolyte layer is of a lamellar structure,

in which the solid electrolyte layer comprises a composition containing a π -electron conjugate polymer and/or other electrically conducting polymer,

in which the electrically conducting polymer is a condensed heteropolycyclic polymer selected from 5,6-dioxymethyleneisothianaphthylene polymer and 5,6-dimethoxyisothianaphthylene polymer.

Claim 11. (previously presented): The solid electrolytic capacitor as claimed in claim 8, in which the condensed heteropolycyclic polymer represented by general formula (III) is a condensed heteropolycyclic polymer represented by general formula (V) below where $k=1$

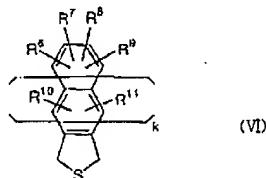


wherein R^6 , R^7 , R^8 , R^9 , R^{10} , R^{11} , δ , Z and j are the same as in formula (III), and the condensed ring may optionally contain 1 to 2 nitrogen atoms or N-oxide.

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Claims 12-28. (canceled).

Claim 29. (withdrawn - currently amended): A method for producing a the solid electrolytic capacitor comprising a valve acting metal having pores, a dielectric film formed on a surface of the valve acting metal, and a solid electrolyte layer provided on the dielectric film, wherein at least a portion of the solid electrolyte layer is of a lamellar structure as claimed in claim 8 or 10, the method comprising polymerizing a condensed heteropolycyclic compound represented by the following formula (VI):



wherein the substituents R⁶, R⁷, R⁸, R⁹, R¹⁰ and R¹¹ each independently represents a monovalent group selected from the group consisting of a hydrogen atom, a linear or branched, saturated or unsaturated C1-10 alkyl, alkoxy or alkyl ester group, a halogen, a nitro group, a cyano group, a primary, secondary or tertiary amino group, a trihalomethyl group, a phenyl group and a substituted phenyl group, the alkyl chains of R⁶, R⁷, R⁸, R⁹, R¹⁰ and R¹¹ may combine to each other at any position to form at least one divalent chain for forming at least one 3-, 4-, 5-, 6- or 7-membered saturated or unsaturated hydrocarbon cyclic structure together with the carbon atoms to which the substituents are bonded,

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the alkyl group, the alkoxy group or the alkylester group of R⁶, R⁷, R⁸, R⁹, R¹⁰ or R¹¹ or the cyclic hydrocarbon chain formed by the substituents may contain any of carbonyl, ether, ester, amide, sulfide, sulfinyl, sulfonyl and imino bonds,

K represents a number of the condensed ring enclosed by the thiophene ring and the benzene ring having substituents R⁵ to R⁹ and represents an Integer of from 0 to 3, and the condensed ring may optionally contain nitrogen or N-oxide alone or together with another anion having a dopant ability, on the dielectric film formed on a porous valve acting metal surface by the action of an oxidizing agent to form a solid electrolyte layer on the dielectric film.

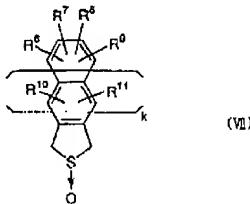
Claim 30. (withdrawn): The method for producing a solid electrolytic capacitor, as claimed in claim 29, in which as the condensed heteropolycyclic compound, there is used at least one member selected from dihydroisothianaphthene, dihydronaphtho[2,3-c]thiophene and dihydrothieno[3,4-b]quinoxaline derivatives.

Claim 31. (withdrawn): The method for producing a solid electrolytic capacitor, as claimed in claim 29, in which at least one member selected from 1,3-dihydroisothianaphthene, 5,6-dioxymethylene-1,3-dihydroisothianaphthene, 5,6-dimethoxy-1,3-dihydroisothianaphthene, 1,3-dihydronaphtho[2,3-c]thiophene and 1,3-dihydrothieno[3,4-b]quinoxaline.

Claim 32. (withdrawn - currently amended): A method for producing a solid electrolytic capacitor comprising a valve acting metal having pores, a dielectric film formed on a surface of the valve acting metal, and a solid electrolyte layer provided on the dielectric film,

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wherein at least a portion of the solid electrolyte layer is of a lamellar structure as claimed in claim 8 or 10, the method comprising polymerizing a condensed heteropolycyclic compound represented by the following formula (VII):



wherein the substituents R⁶, R⁷, R⁸, R⁹, R¹⁰ and R¹¹ each independently represents a monovalent group selected from the group consisting of a hydrogen atom, a linear or branched, saturated or unsaturated C1-10 alkyl, alkoxy or alkyl ester group, a halogen, a nitro group, a cyano group, a primary, secondary or tertiary amino group, a trihalomethyl group, a phenyl group and a substituted phenyl group, the alkyl chains of R⁶, R⁷, R⁸, R⁹, R¹⁰ and R¹¹ may combine to each other at any position to form at least one divalent chain for forming at least one 3-, 4-, 5-, 6- or 7-membered saturated or unsaturated hydrocarbon cyclic structure together with the carbon atoms to which the substituents are bonded,

the alkyl group, the alkoxy group or the alkyl ester group of R⁶, R⁷, R⁸, R⁹, R¹⁰ or R¹¹ or the cyclic hydrocarbon chain formed by the substituents may contain any of carbonyl, ether, ester, amide, sulfide, sulfinyl, sulfonyl and imino bonds,

and k represents a number of a condensed ring enclosed by the thiophene ring and the benzene ring having substituents R⁶ to R⁹ and represents an integer of from 0 to 3, and the condensed ring may optionally contain nitrogen or N-oxide alone or together with another anion

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having a dopant ability, on the dielectric film formed on a porous valve acting metal surface by the action of an oxidizing agent to form a solid electrolyte layer on the dielectric film.

Claim 33. (withdrawn): The method for producing a solid electrolyte as claimed in claim 32, in which as the condensed heteropolycyclic compound, there is used at least one member selected from dihydroisothianaphthene-2-oxide, dihydronaphtho[2,3-c]thiophene-2-oxide and dihydrothieno[3,4-b]quinoxaline-2-oxide derivatives.

Claim 34. (withdrawn): The method for producing a solid electrolytic capacitor, as claimed in claim 32 in which at least one member selected from 1,3-dihydroisothianaphthene-2-oxide, 5,6-dioxymethylene-1,3-dihydroisothianaphthene-2-oxide, 5,6-dimethoxy-1,3-dihydroisothianaphthene-2-oxide, 1,3-dihydronaphtho[2,3-c]thiophene-2-oxide and 1,3-dihydrothieno[3,4-b]quinoxaline-2-oxide.

Claims 35-75. (canceled).